

We claim:

1. A system attribute exchange method for automatically providing at least one system attribute to one or more devices in a network, the method comprising the steps of:
 - 5 (a) automatically sending a device identification message from the one or more Voice-over-IP devices to a node when the device is operably coupled to the node; and
 - (b) automatically responding with a device identification acknowledgment message from the node to the one or more devices, the device identification
10 acknowledgement message comprising one or more system attributes.
2. The system attribute exchange method of claim 1, wherein the one or more devices comprises one or more Voice-over-IP devices, the device identification message is a Voice-over-IP device identification message, and the device identification
15 acknowledgment is a Voice-over-IP device identification acknowledgment message.
3. The system attribute exchange method of claim 2, wherein the one or more system attributes comprises a VLAN identification assigned to Voice-over-IP communications.
20
4. The system attribute exchange method of claim 2, wherein the node is a switching device, and the one or more system attributes comprise a switching device identification as well as a port identification of a port to which the Voice-over-IP device is connected.
25
5. The system attribute exchange method of claim 3, wherein the one or more Voice-over-IP devices comprise one or more IP phones.

6. The system attribute exchange method of claim 3, wherein the Voice-over-IP device is operably coupled to the node at the time of initialization of the Voice-over-IP device.
- 5 7. The system attribute exchange method of claim 3, wherein the Voice-over-IP device identification message and the Voice-over-IP device identification acknowledgment are Attribute Advertisement Protocol messages.
8. The system attribute exchange method of claim 7, wherein a destination address of
10 the Voice-over-IP device identification message includes a unique medium access control (MAC) address indicative of a system attribute exchange between the Voice-over-IP device and node.
9. The system attribute exchange method of claim 3, wherein the Voice-over-IP device
15 identification message is sent in response to a node initialization message.
10. The system attribute exchange method of claim 9, wherein the node initialization message is a switching device initialization message transmitted by a switching device upon the initialization thereof.
- 20 11. The system attribute exchange method of claim 1, wherein the system attribute comprises connectivity information associated with the physical locality of the one or more devices.
- 25 12. The system attribute exchange method of claim 1, wherein the system attribute comprises connectivity information pertaining to physical connection of the one or more Voice-over-IP devices at the node.
13. The system attribute exchange method of claim 12, wherein one or more system
30 attributes are transmitted to a relation database that associates at least one port

number to its geographic location, whereby the physical location of the one or more devices may be determined from the IP address of the Voice-over-IP device.

5 14. The system attribute exchange method of claim 15, wherein the storage device is included in an IP PBX system that cooperates with the Voice-over-IP device to provide voice communications.

10 15. The system attribute exchange method of claim 1, wherein the node is a switching device.

16. The system attribute exchange method of claim 15, wherein the switching device is adjacent to at least one of the one or more devices.

15 17. The system attribute exchange method of claim 15, wherein at least one of the one or more devices is a Voice-over-IP device.

18. The system attribute exchange method of claim 17, wherein at least one of the one or more system attributes is a VLAN identification substantially dedicated to Voice-over IP communication within the network.

20 19. The system attribute exchange method of claim 18, wherein the switching device is made aware of the VLAN identification via a VLAN registration protocol.

25 20. A system attribute exchange system in a distributed communications network for automatically providing at least one system attribute for purposes of configuring Voice-over-IP communications, the system comprising:
(a) a Voice-over-IP device adapted to automatically transmit a Voice-over-IP device identification message when said device is operatively coupled to the said network; and

- (b) a node, operatively coupled to said network, adapted to automatically transmit a Voice-over-IP device identification acknowledgment message to said device, said Voice-over-IP device identification acknowledgment message including one or more system attributes for said Voice-over-IP communications.

5

21. The system attribute exchange system of claim 22, wherein at least one system attribute includes a VLAN identification for over which Voice-over-IP communications are conducted.

- 10 22. The system attribute exchange system of claim 21 wherein the Voice-over-IP device identification message is automatically transmitted when the Voice-over-IP device is operatively coupled to the network.

- 15 23. The system attribute exchange system of claim 23 wherein the Voice-over-IP device identification message is automatically transmitted in response to a switching device initialization message sent upon the initialization of the switching device.

- 20 24. The system attribute exchange system of claim 20, wherein the at least one of the one or more system attributes is a port identifier of a port at said node to which the Voice-over-IP device is connected.

- 25 25. The system attribute exchange system of claim 24, wherein the port number at which the Voice-over-IP device is communicated to a relational database that associates the physical location of the port with the IP address and extension number of the Voice-over-IP device, whereby the location of a Voice-over-IP device user can be quickly ascertained by emergency response personnel.

- 30 26. The system attribute exchange system of claim 25, wherein the system attribute exchange system further includes an IP PBX system comprising said relational database.

27. The system attribute exchange method of claim 8, wherein the MAC address is a broadcast MAC address.

5 28. The system attribute exchange method of claim 8, wherein the MAC address is a multicast MAC address.

29. The system attribute exchange method of claim 19, wherein the VLAN registration protocol is the GARP VLAN registration protocol.

10

30. The system attribute exchange method of claim 12, wherein one or more system attribute are transmitted to a relation database that associates at least one port number to its geographic location, whereby the physical location of the one or more devices may be determined from the MAC address of the Voice-over-IP device.

15

31. The system attribute exchange system of claim 24, wherein the port number at which the Voice-over-IP device is communicated to a relational database that associates the physical location of the port with the MAC address and extension number of the Voice-over-IP device, whereby the location of a Voice-over-IP device user can be quickly ascertained by emergency response personnel.

20

32. A VLAN advertisement system for a voice-over-IP network, comprising:
a first node; and

25

a second node communicating with the first node over a LAN connection;
wherein the first node transmits to the second node a first message sufficient to identify the first node to the second node as an IP phone, and
wherein the second node transmits to the first node a second message responsive to the first message identifying a VLAN reserved for voice-over-IP communications.

30

33. The VLAN advertisement system of claim 32, wherein the first node appends the identified VLAN to packets transmitted by the first node in voice-over-IP communications.

5 34. The VLAN advertisement system of claim 32, wherein the first node automatically sends the first message when the first node is operably coupled to the second node.

35. The VLAN advertisement system of claim 32, wherein the first message includes a destination MAC address reserved for VLAN advertisement protocol exchanges.

10

36. The VLAN advertisement system of claim 32, wherein the second node is a LAN switch.

15 37. The system attribute exchange system of claim 21 wherein the Voice-over-IP device identification message is automatically transmitted when the Voice-over-IP device is initialized in the network.